

What is claimed is:

1. An absorbent structure to be used in contact with human skin of a wearer, the absorbent structure comprising an upper surface oriented toward the skin of the wearer and a lower surface oriented away from the skin of the wearer, the absorbent structure further comprising:
 - a) a water-swellable, water-insoluble polymer having acidic functional groups, wherein the water-swellable, water-insoluble polymer has at least about 50 molar percent of the acidic functional groups in free acid form; and
 - b) a basic material;wherein the absorbent structure exhibits a Wicking Capacity value that is at least about 5 grams per gram of absorbent structure and exhibits a pH on the upper surface that remains within the range of about 3 to about 8.
2. The absorbent structure of Claim 1 wherein the acidic water-swellable, water-insoluble polymer has a pKa between about 0 to about 12.
3. The absorbent structure of Claim 1 wherein the acidic water-swellable, water-insoluble polymer has at least about 70 molar percent of the acidic functional groups in free acid form.
4. The absorbent structure of Claim 1 wherein the absorbent structure further comprises a buffering agent having a pKa between about 2 to about 10.
5. The absorbent structure of Claim 1 wherein the acidic water-swellable, water-insoluble polymer has a weight average molecular weight greater than about 100,000.
6. The absorbent structure of Claim 1 wherein the acidic water-swellable, water-insoluble polymer is prepared from a base polymer selected from the group consisting of polyacrylamides, polyvinyl alcohols, ethylene maleic anhydride copolymer, polyvinylethers, polyacrylic acids, polyvinylpyrrolidones, polyvinylmorpholines, carboxymethyl celluloses, carboxymethyl starches, hydroxypropyl celluloses, algins, alginates, carrageenans, acrylic grafted starches, acrylic grafted celluloses, polyaspartic acid, polyglutamic acid, and copolymers thereof.
7. The absorbent structure of Claim 6 wherein the acidic water-swellable, water-insoluble polymer is prepared from polyacrylic acid.

8. The absorbent structure of Claim 1 wherein the basic material is selected from the group consisting of polyamines, polyimines, polyamides, polyquaternary ammoniums, chitins, chitosans, polyasparagines, polyglutamines, polylysines, polyarginines, aliphatic amines, aromatic amines, imines, amides, metallic oxides, hydroxides, salts, and mixtures thereof.
9. The absorbent structure of Claim 8 wherein the basic material is selected from the group consisting of sodium hydrogen carbonate and sodium carbonate.
10. The absorbent structure of Claim 9 wherein the acidic water-swellable, water-insoluble polymer and the basic material are present in the absorbent structure in a molar ratio from about 10:1 to about 1:10.
11. The absorbent structure of Claim 1 wherein the absorbent structure exhibits a Wicking Capacity value that is at least about 10 grams per gram of absorbent structure.
12. The absorbent structure of Claim 1 wherein the absorbent structure exhibits a pH on the upper surface that remains within the range of about 4 to about 7.
13. The absorbent structure of Claim 1 wherein the water-swellable, water-insoluble polymer has at least about 70 molar percent of the acidic functional groups in free acid form, has a weight average molecular weight greater than about 100,000, and the acidic water-swellable, water-insoluble polymer and the basic material are present in the absorbent structure in a molar ratio between about 10:1 to about 1:10.
14. The absorbent structure of Claim 4 wherein the buffering agent is selected from the group consisting of aspartic acid, ascorbic acid, chloroacetic acid, β -chlorobutyric acid, cis-cinnamic acid, citric acid, fumaric acid, glutaramic acid, glutaric acid, itaconic acid, lactic acid, malic acid, malonic acid, o-phthalic acid, succinic acid, α -tataric acid, and phosphoric acid, α -alanine, allantoin, cysteine, cystine, dimethylglycine, histidine, glycine, chitosan, N-(2-acetamido)-2-iminodiacetic acid, tris(hydroxymethyl)aminomethane, theobromine, and tyrosine.
15. The absorbent structure of Claim 14 wherein the buffering agent is citric acid.
16. The absorbent structure of Claim 4 wherein the acidic water-swellable, water-insoluble polymer is prepared from polyacrylic acid, the basic material is selected from the group consisting of sodium hydrogen carbonate and sodium carbonate, and the buffering agent is citric acid.

17. A disposable absorbent product comprising a liquid-permeable topsheet, a backsheet attached to the topsheet, and an absorbent structure positioned between the topsheet and the backsheet wherein the absorbent structure comprises:

- a) a water-swellable, water-insoluble polymer having acidic functional groups, wherein the water-swellable, water-insoluble polymer has at least about 50 molar percent of the acidic functional groups in free acid form; and
- b) a basic material;

wherein the absorbent structure exhibits a Wicking Capacity value that is at least about 5 grams per gram of absorbent structure and exhibits a pH on the upper surface that remains within the range of about 3 to about 8.

18. The disposable absorbent product of Claim 17 wherein the acidic water-swellable, water-insoluble polymer has a pKa between about 0 to about 12.

19. The disposable absorbent product of Claim 17 wherein the acidic water-swellable, water-insoluble polymer has at least about 70 molar percent of the acidic functional groups in free acid form.

20. The disposable absorbent product of Claim 17 wherein the absorbent structure further comprises a buffering agent having a pKa between about 2 to about 10.

21. The disposable absorbent product of Claim 17 wherein the acidic water-swellable, water-insoluble polymer has a weight average molecular weight greater than about 100,000.

22. The disposable absorbent product of Claim 17 wherein the acidic water-swellable, water-insoluble polymer is prepared from a base polymer selected from the group consisting of polyacrylamides, polyvinyl alcohols, ethylene maleic anhydride copolymer, polyvinylethers, polyacrylic acids, polyvinylpyrrolidones, polyvinylmorpholines, carboxymethyl celluloses, carboxymethyl starches, hydroxypropyl celluloses, algins, alginates, carrageenans, acrylic grafted starches, acrylic grafted celluloses, polyaspartic acid, polyglutamic acid, and copolymers thereof.

23. The disposable absorbent product of Claim 17 wherein the acidic water-swellable, water-insoluble polymer is prepared from polyacrylic acid.

24. The disposable absorbent product of Claim 17 wherein the basic material is selected from the group consisting of polyamines, polyimines, polyamides,

polyquaternary ammoniums, chitins, chitosans, polyasparagines, polyglutamines, polylysines, polyarginines, aliphatic amines, aromatic amines, imines, amides, metallic oxides, hydroxides, salts, and mixtures thereof.

25. The disposable absorbent product of Claim 24 wherein the basic material is selected from the group consisting of sodium hydrogen carbonate and sodium carbonate.
26. The disposable absorbent product of Claim 17 wherein the acidic water-swellable, water-insoluble polymer and the basic material are present in the absorbent structure in a molar ratio from about 10:1 to about 1:10.
27. The disposable absorbent product of Claim 17 wherein the absorbent structure exhibits a Wicking Capacity value that is at least about 10 grams per gram of absorbent structure.
28. The disposable absorbent product of Claim 17 wherein the absorbent structure exhibits a pH on the upper surface that remains within the range of about 4 to about 7.
29. The disposable absorbent product of Claim 17 wherein the water-swellable, water-insoluble polymer has at least about 70 molar percent of the acidic functional groups in free acid form, has a weight average molecular weight greater than about 100,000, and the acidic water-swellable, water-insoluble polymer and the basic material are present in the absorbent structure in a molar ratio between about 10:1 to about 1:10.
30. The disposable absorbent product of Claim 20 wherein the buffering agent is selected from the group consisting of aspartic acid, ascorbic acid, chloroacetic acid, β -chlorobutyric acid, cis-cinnamic acid, citric acid, fumaric acid, glutaramic acid, glutaric acid, itaconic acid, lactic acid, malic acid, malonic acid, o-phthalic acid, succinic acid, α -tataric acid, and phosphoric acid, α -alanine, allantoin, cysteine, cystine, dimethylglycine, histidine, glycine, chitosan, N-(2-acetamido)-2-iminodiacetic acid, tris(hydroxymethyl)aminomethane, theobromine, and tyrosine.
31. The disposable absorbent product of Claim 30 wherein the buffering agent is citric acid.
32. The disposable absorbent product of Claim 32 wherein the acidic water-swellable, water-insoluble polymer is prepared from polyacrylic acid, the basic material is selected from the group consisting of sodium hydrogen carbonate and sodium carbonate, and the buffering agent is citric acid.

33. An absorbent structure to be used in contact with human skin of a wearer, the absorbent structure comprising an upper surface oriented toward the skin of the wearer and a lower surface oriented away from the skin of the wearer, the absorbent structure further comprising:

- a) a water-swellable, water-insoluble polymer having basic functional groups, wherein the water-swellable, water-insoluble polymer has at least about 50 molar percent of the basic functional groups in free base form; and
- b) an acidic material;

wherein the absorbent structure exhibits a Wicking Capacity value that is at least about 5 grams per gram of absorbent structure and exhibits a pH on the upper surface that remains within the range of about 3 to about 8.

34. The absorbent structure of Claim 33 wherein the basic water-swellable, water-insoluble polymer has a pKa between about 2 to about 14.

35. The absorbent structure of Claim 33 wherein the basic water-swellable, water-insoluble polymer has at least about 70 molar percent of the basic functional groups in free base form.

36. The absorbent structure of Claim 33 wherein the absorbent structure further comprises a buffering agent having a pKa between about 2 to about 10.

37. The absorbent structure of Claim 33 wherein the basic water-swellable, water-insoluble polymer has a weight average molecular weight greater than about 100,000.

38. The absorbent structure of Claim 33 wherein the basic water-swellable, water-insoluble polymer is prepared from a base polymer selected from the group consisting of polyamines, polyethyleneimines, polyacrylamides, polydiallyl dimethyl ammonium hydroxide, polyquaternary ammoniums, chitin, chitosan, polyasparagines, polyglutamines, polylysines, polyarginines, and copolymers thereof.

39. The absorbent structure of Claim 38 wherein the basic water-swellable, water-insoluble polymer is polydiallyl dimethyl ammonium hydroxide.

40. The absorbent structure of Claim 33 wherein the acidic material is selected from the group consisting of polyacrylic acid, polymaleic acid, carboxymethyl cellulose, alginic acid, polyaspartic acid, polyglutamic acid, citric acid, glutamic acid, aspartic acid, inorganic acids; salts, and mixtures thereof.

41. The absorbent structure of Claim 40 wherein the acidic material is polyacrylic acid.
42. The absorbent structure of Claim 33 wherein the basic water-swellable, water-insoluble polymer and the acidic material are present in the absorbent structure in a molar ratio from about 10:1 to about 1:10.
43. The absorbent structure of Claim 33 wherein the absorbent structure exhibits a Wicking Capacity value that is at least about 10 grams per gram of absorbent structure.
44. The absorbent structure of Claim 33 wherein the absorbent structure exhibits a pH on the upper surface that remains within the range of about 4 to about 7.
45. The absorbent structure of Claim 33 wherein the water-swellable, water-insoluble polymer has at least about 70 molar percent of the basic functional groups in free base form, has a weight average molecular weight greater than about 100,000, and the basic water-swellable, water-insoluble polymer and the acidic material are present in the absorbent structure in a molar ratio between about 10:1 to about 1:10.
46. The absorbent structure of Claim 33 wherein the buffering agent is selected from the group consisting of aspartic acid, ascorbic acid, chloroacetic acid, β -chlorobutyric acid, cis-cinnamic acid, citric acid, fumaric acid, glutaramic acid, glutaric acid, itaconic acid, lactic acid, malic acid, malonic acid, o-phthalic acid, succinic acid, α -tataric acid, and phosphoric acid, α -alanine, allantoin, cysteine, cystine, dimethylglycine, histidine, glycine, chitosan, N-(2-acetamido)-2-iminodiacetic acid, tris(hydroxymethyl)aminomethane, theobromine, and tyrosine.
47. The absorbent structure of Claim 46 wherein the buffering agent is citric acid.
48. The absorbent structure of Claim 47 wherein the basic water-swellable, water-insoluble polymer is polydiallyl dimethyl ammonium hydroxide, the acidic material is polyacrylic acid, and the buffering agent is citric acid.
49. A disposable absorbent product comprising a liquid-permeable topsheet, a backsheet attached to the topsheet, and an absorbent structure positioned between the topsheet and the backsheet wherein the absorbent structure comprises:
 - a) a water-swellable, water-insoluble polymer having basic functional groups, wherein the water-swellable, water-insoluble polymer has at least about 50 molar percent of the basic functional groups in free base form; and

b) a basic material; and

c) a buffering agent having a pKa between about 2 to about 10;

wherein the absorbent structure exhibits a Wicking Capacity value that is at least about 5 grams per gram of absorbent structure and exhibits a pH on the upper surface that remains within the range of about 3 to about 8.

50. The disposable absorbent product of Claim 49 wherein the basic water-swellable, water-insoluble polymer has a pKa between about 2 to about 14.

51. The disposable absorbent product of Claim 49 wherein the basic water-swellable, water-insoluble polymer has at least about 70 molar percent of the basic functional groups in free base form.

52. The disposable absorbent product of Claim 49 wherein the absorbent structure further comprises a buffering agent having a pKa between about 2 to about 10.

53. The disposable absorbent product of Claim 49 wherein the basic water-swellable, water-insoluble polymer has a weight average molecular weight greater than about 100,000.

54. The disposable absorbent product of Claim 49 wherein the basic water-swellable, water-insoluble polymer is prepared from a base polymer selected from the group consisting of polyamines, polyethyleneimines, polyacrylamides, polydiallyl dimethyl ammonium hydroxide, polyquaternary ammoniums, chitin, chitosan, polyasparagines, polyglutamines, polylysines, polyarginines, and copolymers thereof.

55. The disposable absorbent product of Claim 49 wherein the basic water-swellable, water-insoluble polymer is polydiallyl dimethyl ammonium hydroxide.

56. The disposable absorbent product of Claim 49 wherein the acidic material is selected from the group consisting of polyacrylic acid, polymaleic acid, carboxymethyl cellulose, alginic acid, polyaspartic acid, polyglutamic acid, citric acid, glutamic acid, aspartic acid, inorganic acids; salts, and mixtures thereof.

57. The disposable absorbent product of Claim 56 wherein the acidic material is polyacrylic acid.

58. The disposable absorbent product of Claim 49 wherein the basic water-swellable, water-insoluble polymer and the acidic material are present in the absorbent structure in a molar ratio from about 10:1 to about 1:10.
59. The disposable absorbent product of Claim 49 wherein the absorbent structure exhibits a Wicking Capacity value that is at least about 10 grams per gram of absorbent structure.
60. The disposable absorbent product of Claim 49 wherein the absorbent structure exhibits a pH on the upper surface that remains within the range of about 4 to about 7.
61. The disposable absorbent product of Claim 49 wherein the water-swellable, water-insoluble polymer has at least about 70 molar percent of the basic functional groups in free base form, has a weight average molecular weight greater than about 100,000, and the basic water-swellable, water-insoluble polymer and the acidic material are present in the absorbent structure in a molar ratio between about 10:1 to about 1:10.
62. The disposable absorbent product of Claim 49 wherein the buffering agent is selected from the group consisting of aspartic acid, ascorbic acid, chloroacetic acid, β -chlorobutyric acid, cis-cinnamic acid, citric acid, fumaric acid, glutaramic acid, glutaric acid, itaconic acid, lactic acid, malic acid, malonic acid, o-phthalic acid, succinic acid, α -tataric acid, and phosphoric acid, α -alanine, allantoin, cysteine, cystine, dimethylglycine, histidine, glycine, chitosan, N-(2-acetamido)-2-iminodiacetic acid, tris(hydroxymethyl)aminomethane, theobromine, and tyrosine.
63. The disposable absorbent product of Claim 62 wherein the buffering agent is citric acid.
64. The disposable absorbent product of Claim 49 wherein the basic water-swellable, water-insoluble polymer is polydiallyl dimethyl ammonium hydroxide, the acidic material is polyacrylic acid, and the buffering agent is citric acid.